

DIFFERENTIAL OBJECT MARKING AND ITS PREDICTIVE PROCESSING AS AN ANIMACY CUE AMONG CHILD HERITAGE SPEAKERS OF SPANISH

Aaron Santa María^{1,2,3}, Brechje van Osch¹, Terje Lohndal^{1,4}, Robert Hartsuiker³ & Jason Rothman^{1,5,6}

¹CENTER FOR LANGUAGE, BRAIN & LEARNING (UIT), ²DEPARTMENT OF LINGUISTICS (UGENT), ³DEPARTMENT OF EXPERIMENTAL PSYCHOLOGY (UGENT), ⁴NORWEGIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY, ⁵BRAIN AND BILINGUAL EXPERIENCES LABORATORY (LANCASTER UNIVERSITY), ⁶NEBRIJA UNIVERSITY

Heritage language acquisition

Individual variability leading to divergent acquisition

- Quantitatively & qualitatively different input (Rothman, 2007; 2009)
- Cross-linguistic influence (Benmamoun et al., 2013)
- Language shift (Silva Corvalán, 1994)
- Cross-generational attrition (Pires & Rothman, 2009; Montrul & Sánchez Walker, 2013; Montrul, 2014; Pascual y Cabo, 2018)

Heritage acquisition of Spanish DOM

- Child & adult HSs frequently omit DOM before animate objects (Montrul & Sánchez Walker, 2013; Montrul, 2014)
- Quantitatively different input conditioned by the exposure & use of Spanish at home
- Qualitatively different input conditioned by parents' age, length of residence in the host country & age of acquisition of societal language

Predictive processing in heritage speakers (HSs)

An ability to predict based on cues not present in L2?

- Early & naturalistic acquisition of linguistic input (Fuchs, 2021; 2022)
- Literacy & reading fluency (Parshina et al., 2022)
- Consistently-used & perceptually salient morphosyntactic markers (Parshina et al., 2022; Sekerina, 2015)
- Combination of multiple morphosyntactic cues lead to bigger prediction effects (Karaca et al., 2024)

Participants

Chile (control): 31 children ($M_{\text{age}} = 10.52$ years; $M_{\text{PPVT}} = 71.59$)

The Netherlands (NL): 25 children HSs ($M_{\text{age}} = 10.95$ years; $M_{\text{PPVT}} = 49.78$)

United Kingdom (UK): 29 child HSs ($M_{\text{age}} = 10.65$ years; $M_{\text{PPVT}} = 61.19$)

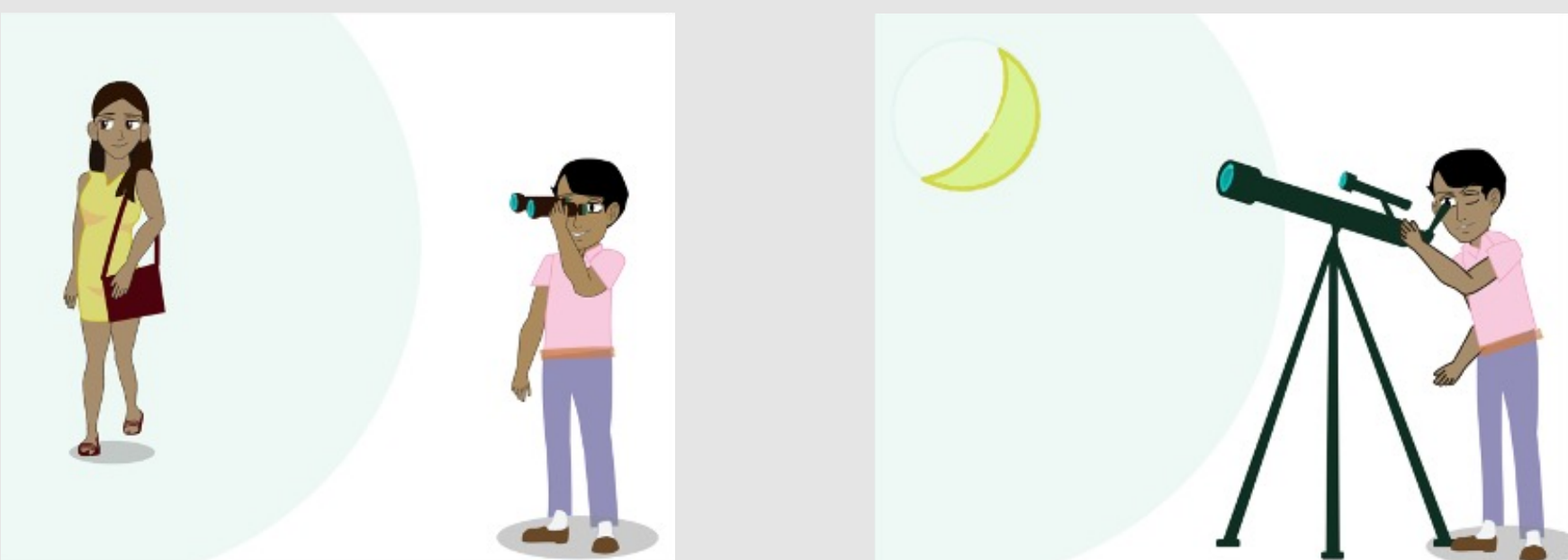
Differential object marking (DOM) in Spanish

→ marking of animate-specific* direct objects with the preposition *a*

(1)	<i>Juan abraza a la mujer</i>	
	Juan hugs DOM DEF woman	[+anim; +spec]
(2)	<i>Juan abraza una mujer</i>	
	Juan hugs IND woman	[+anim; -spec]
(3)	<i>Juan abraza el árbol</i>	
	Juan hugs DEF tree	[-anim; +spec]
(4)	<i>Juan abraza un árbol</i>	
	Juan hugs IND tree	[-anim; -spec]

*among other "fuzzy" syntactic, semantic, and pragmatic constraints (Montrul, 2014: 179)

Experiment 1: Picture description



¿Qué está haciendo el hombre? (What is the man doing?)

Animate condition

El hombre está mirando a la mujer.
(The man is looking at the woman.)

Inanimate condition

El hombre está mirando la luna.
(The man is looking at the moon.)

Experiment 2: Video-elicited story retelling

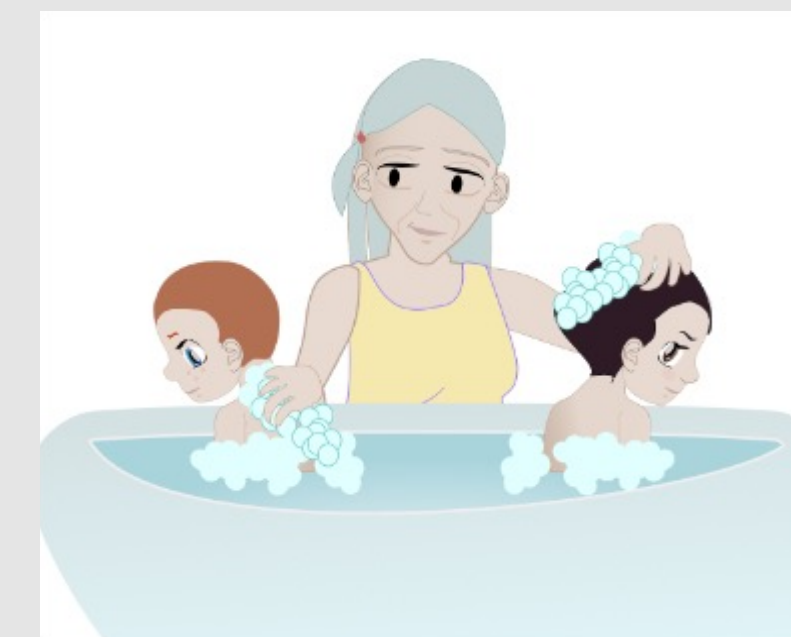


Ellos están persiguiendo al / el lobo. (They are chasing the wolf.)

Experiment 3: Visual world eye-tracking

DOM condition

La señora está lavando a los dos niños.
(The woman is washing the two children.)

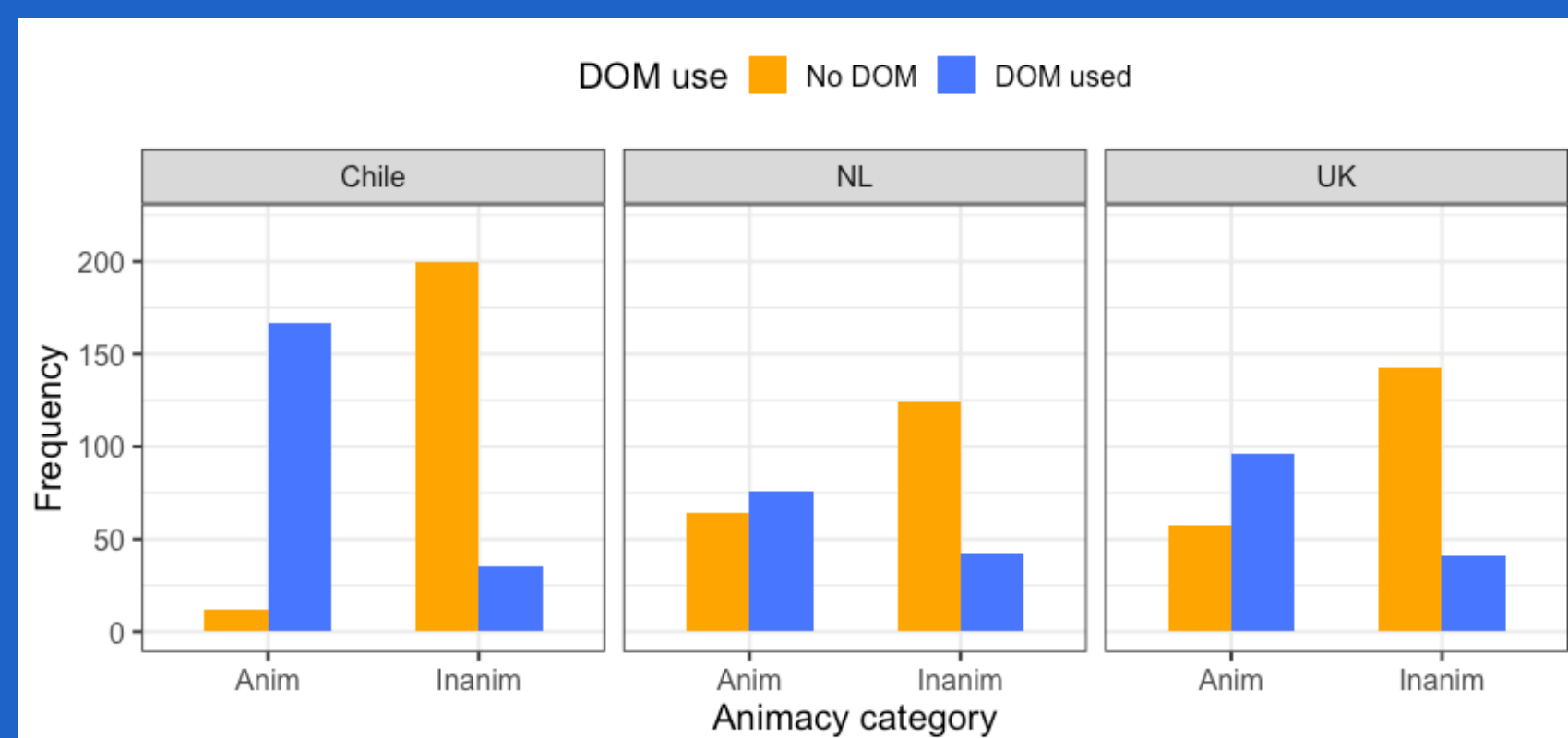


No-DOM condition

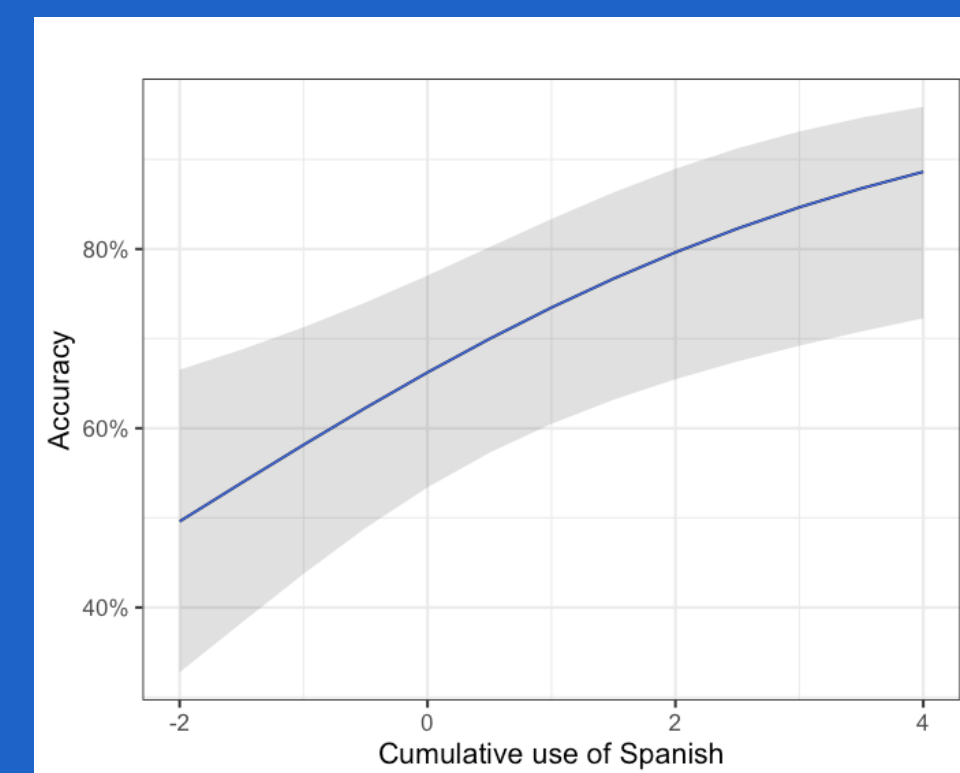
La señora está lavando los dos platos.
(The woman is washing the two plates.)



Child HSs use DOM less frequently & accurately

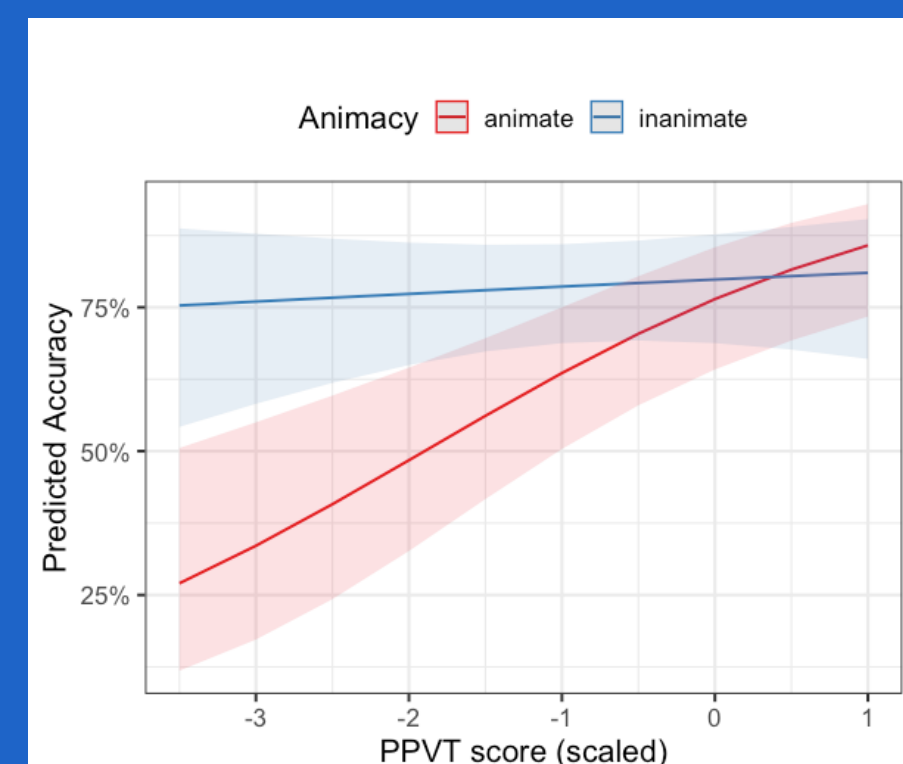


- Monolingual controls were more accurate in using DOM than child HSs ($\beta = 1.590$; $SE = 0.241$; $Z = 6.599$; $p < 0.001$).
- There were no differences in accuracy between the NL and UK HSs. Child HSs not only tended to omit DOM, but also used them where it is not appropriate.
- Significant interaction with animacy ($\beta = 1.853$; $SE = 0.405$; $Z = 4.572$; $p < 0.001$); child HSs were more accurate with animate nouns, indicating that NL & UK child HSs underuse DOM.

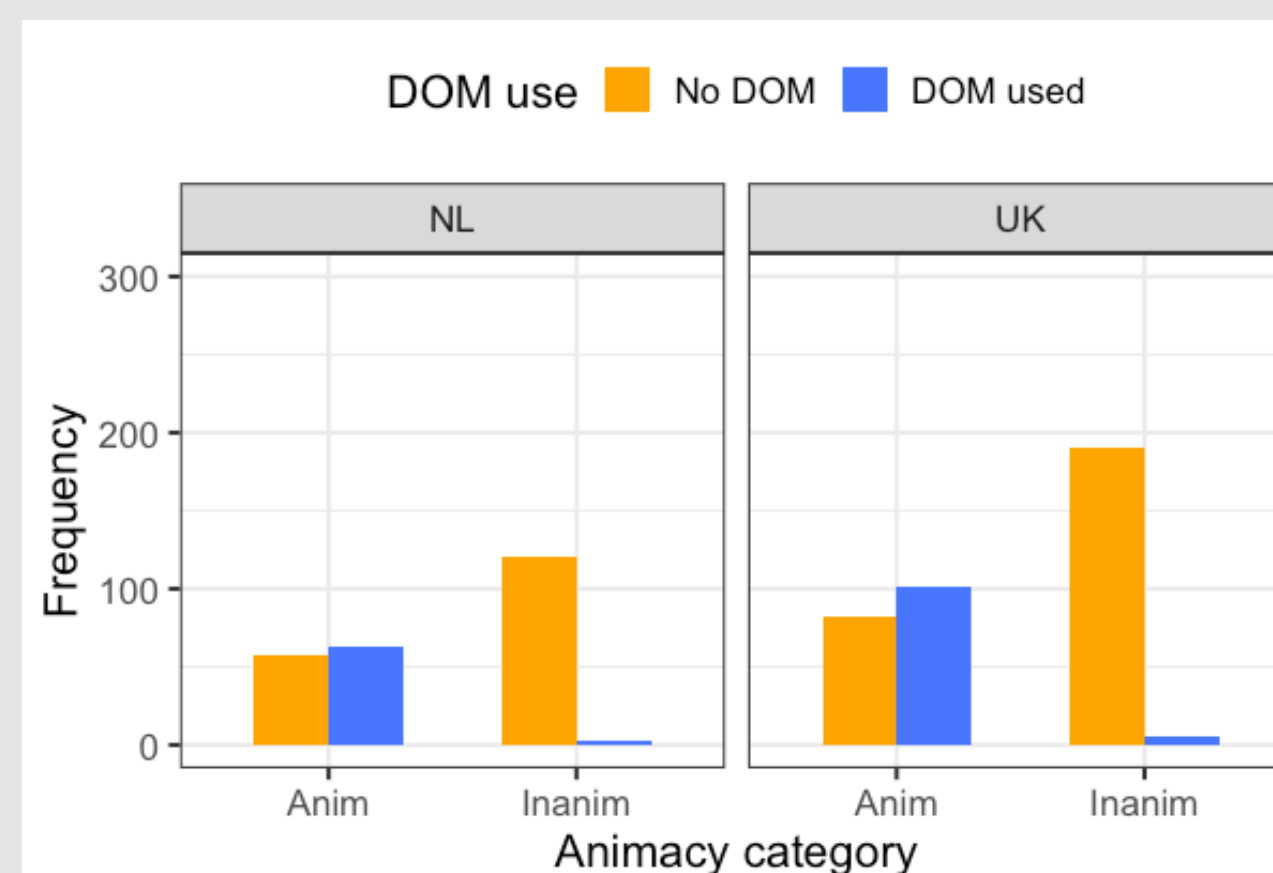


Main effect of cumulative use on DOM accuracy

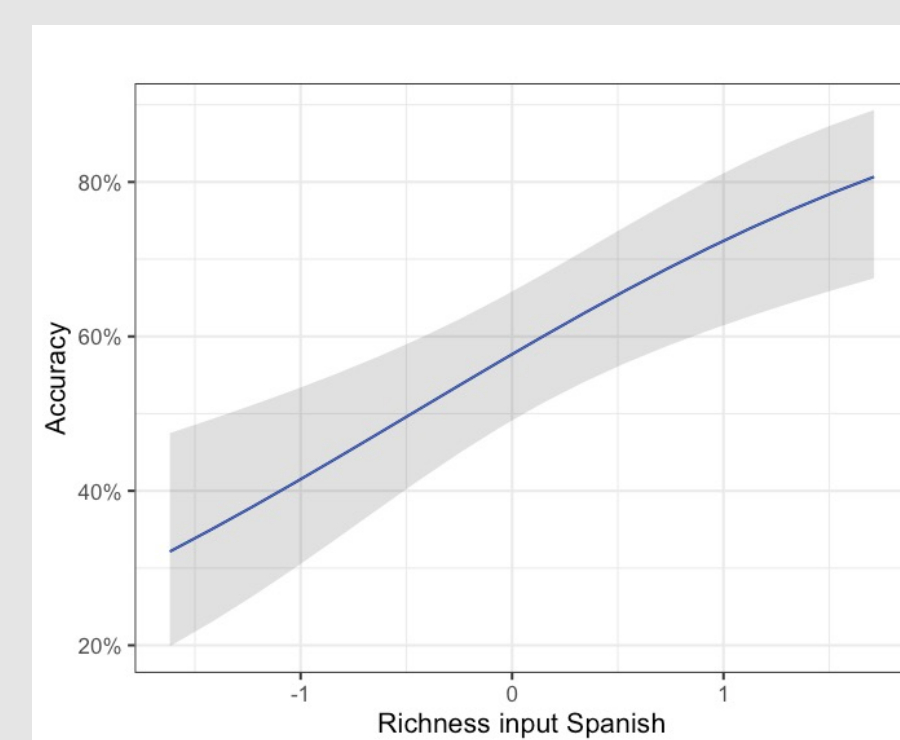
($\beta = 0.349$; $SE = 0.120$; $Z = 2.877$; $p = 0.004$)



High proficiency & rich linguistic input matter



- There were no differences between the DOM use of the two HSs groups who both tended to omit DOM.

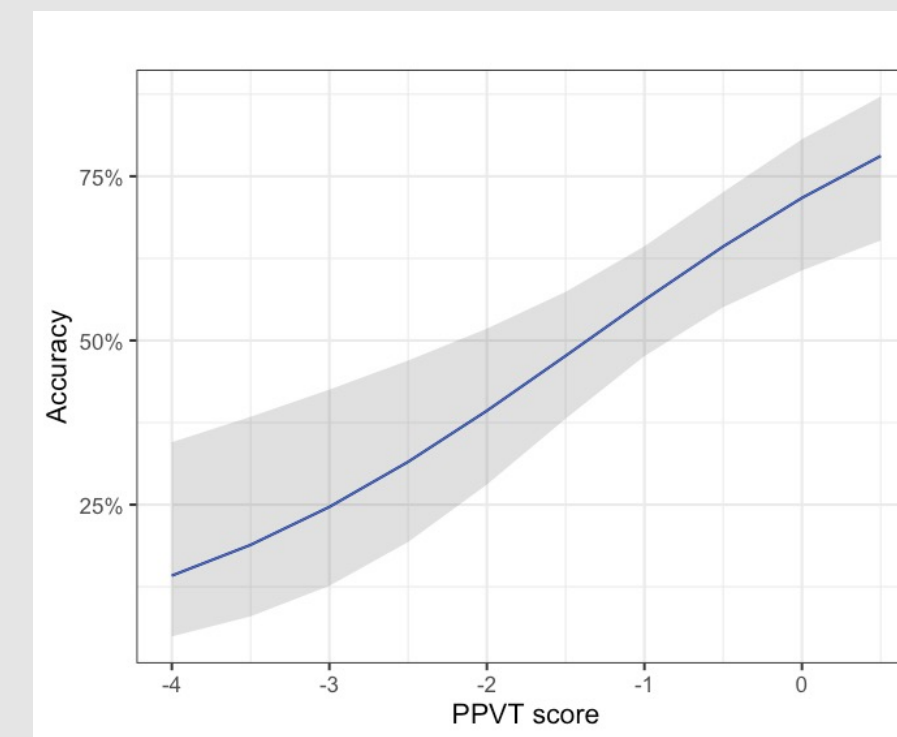


Main effect of richness of Spanish input (QEx) on DOM accuracy

($\beta = 0.653$; $SE = 0.182$; $Z = 3.593$; $p < 0.001$)

Main effect of Spanish proficiency (PPVT) on DOM accuracy

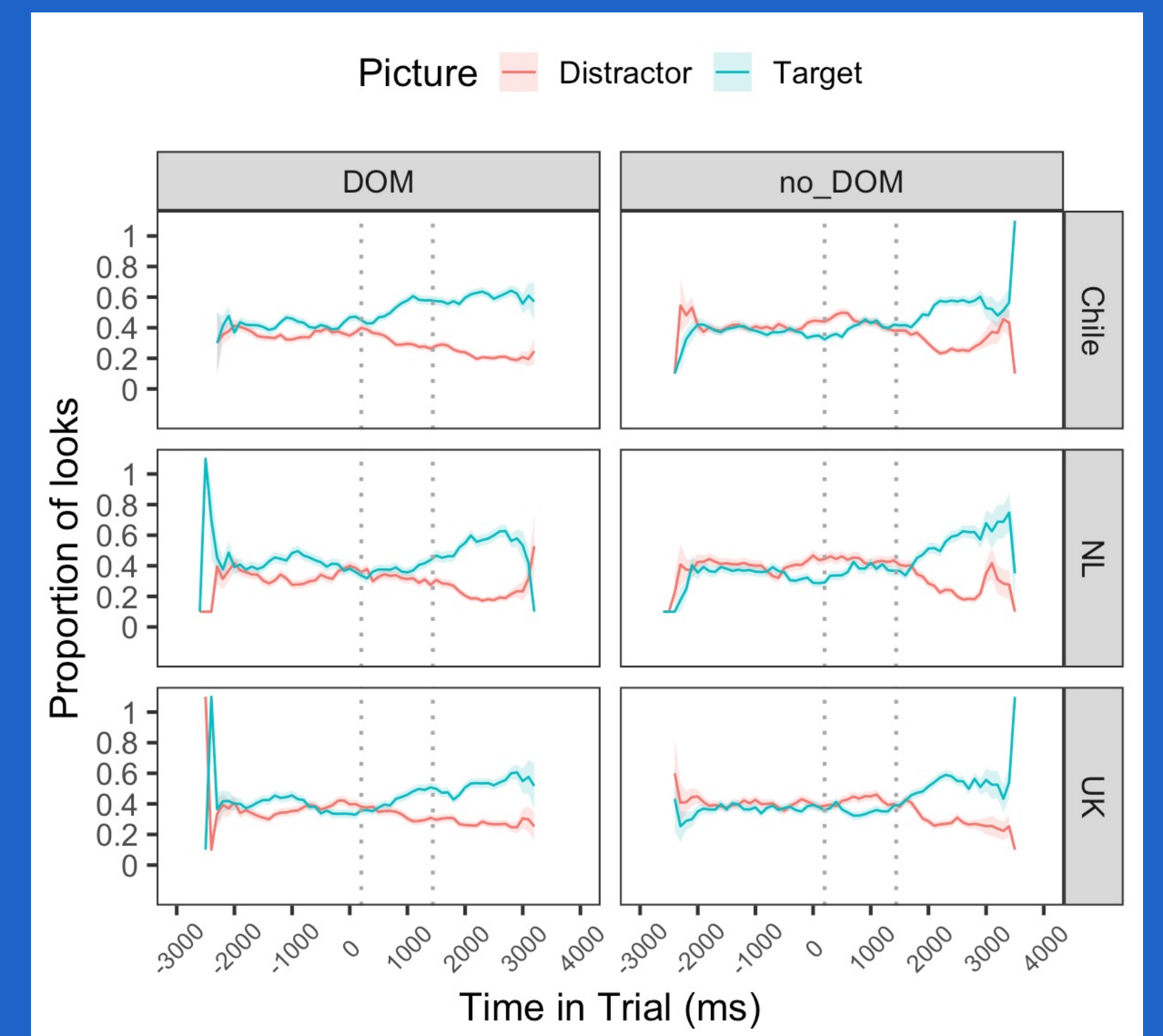
($\beta = 0.692$; $SE = 0.189$; $Z = 3.620$; $p < 0.001$)



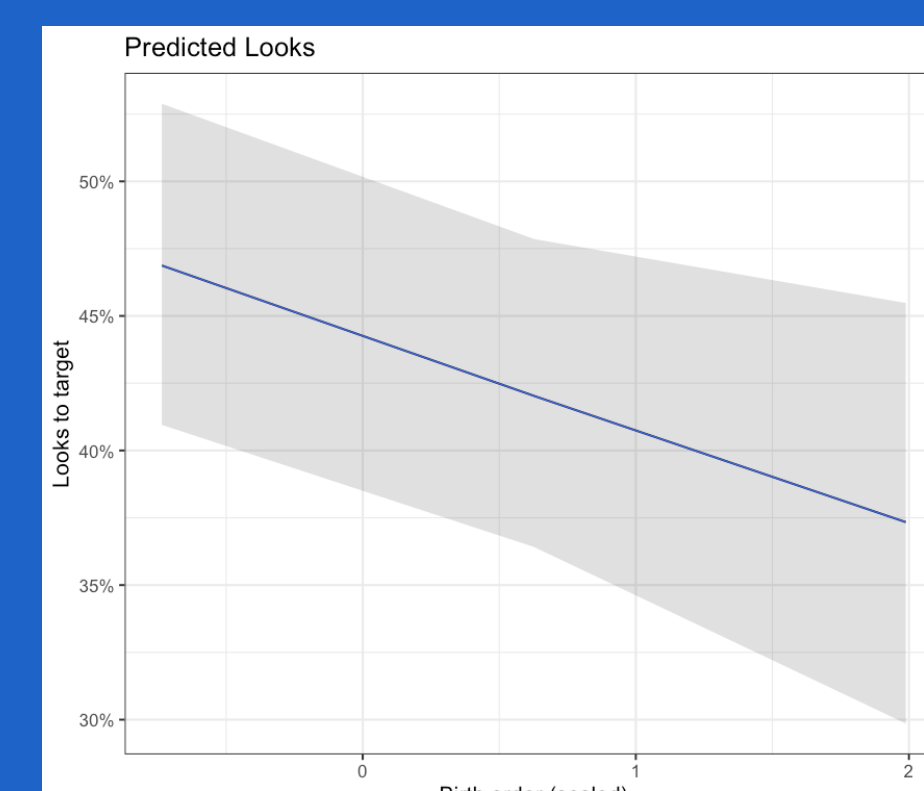
Discussion

Similar to previous research, input quality (i.e., proficiency & richness) and quantity (i.e., cumulative use) impact the accurate use of DOM among child HSs in spoken production. While DOM omission errors were frequently encountered in both production tasks, numerous commission errors (i.e., using DOM where it is not needed) were only attested in the picture description task, and not in the story retelling task. Moreover, similar to their monolingual counterparts, child HSs seem to anticipate the target referent by using DOM as an animacy cue, but not in the absence of *a*-marking. The predictive effect was negatively conditioned by age & birth order. This finding implies that younger HSs and those without older siblings had better predictive abilities.

Child HSs of Spanish can predict

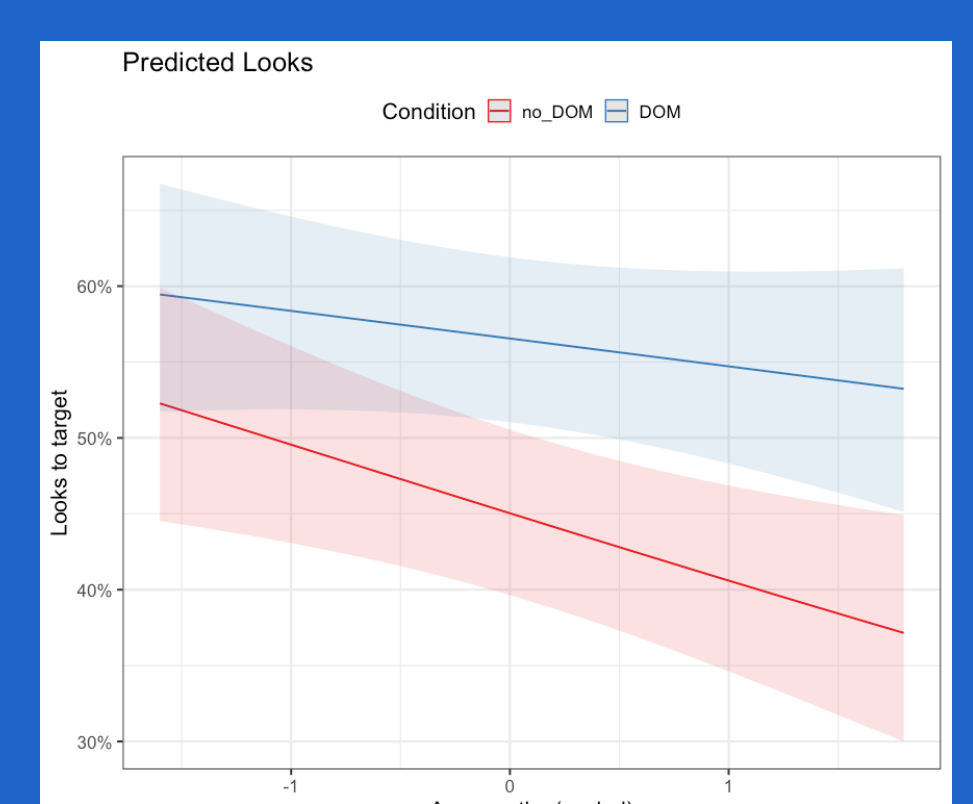


- Monolingual controls launched predictive gazes to the target more than child HSs ($\beta = 0.392$; $SE = 0.0582$; $Z = 6.736$; $p < 0.001$) after hearing the *a*-marking, but not in the absence of DOM.
- Tukey's HSD showed that child HSs from NL ($p = 0.047$) and UK ($p = 0.0159$) anticipated the target picture in the DOM condition.



Main effect of birth order on predictive looks to the target

($\beta = -0.144$; $SE = 0.069$; $Z = -2.221$; $p = 0.026$)



Age * condition

($\beta = 0.107$; $SE = 0.042$; $Z = 2.577$; $p = 0.001$)

References

- Benmamoun, E., Montrul, S., & Polinsky, M. (2013). Heritage languages and their speakers: Opportunities and challenges for linguistics. *Theoretical Linguistics*, 39(3-4), 129-181. Fuchs, Z. (2021). Facilitative use of grammatical gender in Heritage Spanish. *Linguistic Approaches to Bilingualism*, 2(4), 845-871. Fuchs, Z. (2022). Extracting evidence for heritage speakers' access to abstract syntactic agreement features in real-time processing. *Frontiers in Psychology*, 13, 960376. Karaca, F., Browner, S., Linworth, S., & Huettig, F. (2024). Morphosyntactic predictive processing in adult heritage speakers: effects of cue availability and spoken and written language experience. *Language, Cognition and Neuroscience*, 39(1), 118-135. Montrul, S., & Sánchez Walker, N. (2013). Differential object marking in child and adult Spanish heritage speakers. *Language Acquisition*, 20(2), 109-132. Montrul, S. (2014). Structural changes in Spanish in the United States: Differential object marking in Spanish heritage speakers across generations. *Lingua*, 151, 177-196. Parshina, O., Lopukhina, A., & Sekerina, I. A. (2022). Can heritage speakers predict lexical and morphosyntactic information in reading? *Languages*, 7(1), 60. Pascual y Cabo, D. (2018). Examining the role of cross-generational attrition in the development of Spanish as a heritage language: Evidence from gustar-like verbs. *Linguistic Approaches to Bilingualism*, 1(1), 86-108. Pires, A., & Rothman, J. (2009). Disentangling sources of incomplete acquisition: An explanation for competence divergence across heritage grammars. *International Journal of Bilingualism*, 15(2), 211-238. Rothman, J. (2007). Heritage speaker competence differences, language change, and input type: Inflected infinitives in Heritage Brazilian Portuguese. *International Journal of Bilingualism*, 11(4), 359-389. Rothman, J. (2009). Understanding the nature and outcomes of early bilingualism: Romance languages as heritage languages. *International Journal of Bilingualism*, 13, 155-163. Sekerina, I. A. (2015). Predictions, fast and slow. *Linguistic Approaches to Bilingualism*, 8(4), 532-556. Silva-Corvalán, C. (1994). *Language contact and change: Spanish in Los Angeles*. Oxford University Press.

aaron.santamaria@ugent.be | brechje.a.osch@uit.no